

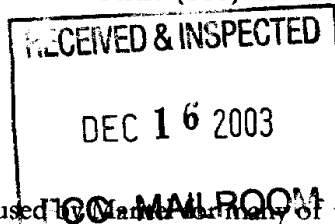
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December 10, 2003

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Comments of Shine Micro, Inc. Regarding DA 03-3369 (Maritel)



I am the designer of the SEA157 marine VHF DSC radiotelephone. It was used in Maritel's tests cited in their document DA 03-3585. It is a good VHF transceiver and almost meets the RTCM SC117 recommendations; not many radios do.

I have been anxious to see Maritel build out it's Marinet system. It would be good for marine VHF radio sales, and I might want to make an occasional ship to shore call on rare occasions when I have time to go boating. Email on my boat would be even better.

The SEA157, like all marine VHF's, has 10 public correspondence channels: 24, 25, 26, 27, 28, 84, 85, 86, 87, 88. Here in Puget Sound they are always quiet except for a station on Whidbey Island that sends a free signal recording, but never seems to have any traffic.

I hoped that Maritel, with its Marinet, would change that. I have been waiting about 4 ½ years and there is nothing happening on Puget Sound. It seems a real waste to just "warehouse" this spectrum.

September 11, 2001 changed my world. I have boys of military age. What can I do to make the US (and the rest of the world) a safer place? The answer is AIS. I joined the IEC TC80 WG8A Class B AIS standards committee to see what I could do to help.

After my first meeting at RTCM in San Diego I became convinced of three things:

1. We need AIS on ALL of the boats, not just the big ships.
2. In order to do that, AIS must be cheap, but high enough in quality to not interfere with the Class A AIS used on SOLAS ships.
3. A large redundant network of AIS receivers is needed to monitor AIS and provide this information to the proper authorities.

After a couple more meetings I learned some of the misconceptions regarding AIS:

1. AIS works very badly or not at all on 12.5 KHz channel assignments. USCG simulations showed how badly it worked (the "garble" zones are huge) and no one could show any evidence of it ever being tested in any comprehensive real world test. We deleted the 12.5 KHz bandwidth mode from the IEC 62287 specification when we realized that it could never be used. I believe that the 12.5 KHz bandwidth mode will be deleted from the Class A AIS specification eventually too.
2. AIS doesn't need "frequency management". AIS is Self Organizing and works great even with no shore stations around to control it. In fact shore station control of AIS is very dangerous if not done very carefully.
3. There was much talk of AIS operation on "alternate frequencies" when AIS1 and AIS2 (87B and 88B) were not available. What alternate frequencies? The problem is that AIS really needs 25 KHz channels and there are no other channels available.

AIS will serve thousands of boats SIMULTANEOUSLY and elegantly with no "channel management". It will provide safer navigation, collision avoidance, and enhanced homeland security, especially if we can drive

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the cost down enough to put it on small boats. A service that provides so many benefits to so many mariners deserves two 25 KHz channels. In fact it deserves 25 KHz guard channels too. This is primarily to protect AIS from public correspondence interference, but also to protect public correspondence (if we ever have any again) from being interfered by AIS.

In contrast to AIS, with a few exceptions, the public correspondence channels don't currently serve anyone.

My company's goal is to provide Class B AIS transponders for less than \$500.00. I think that the US government should subsidize the use of AIS as a low cost enhancement to homeland security. Maritel's proposal to "manage" AIS and charge fees of \$375.00 to register for an MMSI is not the right answer. Boat US does a great job of MMSI registration and does it for free. If Maritel has a monopoly on MMSI and AIS management, I believe the costs will be much too high.

The IEC Class B AIS committee has 2 major problems which are slowing the completion of IEC 62287 (the Class B AIS spec.)

1. The patent dispute with Mr Hakan Lans of Sweden regarding SOTDMA.
2. The US inability to establish what its AIS channels will be.

Regarding problem 1: I have proposed a "polite" alternative to SOTDMA that has acquired the acronym CS-TDMA for: Carrier Sensing Time Domain Multiple Access. Patent(s) are pending and there will be no royalties for AIS.

Regarding problem 2: The US government should "take" 27B(guard channel), 87B (AIS1), 28B(guard channel), 88B (AIS2), and a 25 KHz NTIA guard channel above.

Maritel paid a high price for those 4 25 KHz channels and should be compensated for this taking. How much? I don't know, but I suspect that based upon the past 4 ½ years of inactivity on the public correspondence channels, if Auction 20 and 39 were held again, the bidding would be much lower. I believe that Maritel filed comments after Auction 20 to the effect that the bidding was improperly too high. If a company can not make a profit from a spectrum allocation, then perhaps the value of that spectrum is not that high.

If the US government is to "take" 100 KHz of Maritel spectrum licenses to enable the efficient implementation of AIS in the US, this is an ideal time. The spectrum is virtually unused.

If Maritel had completed a substantial portion of it's buildout, this could have been a much bigger problem.

AIS1 and AIS2 will never be of much use to Maritel for anything except AIS. All ships beyond 12 miles will be on AIS1 and AIS2 regardless of what the US decides. Maritel operation on these channels could interfere with high seas navigation and homeland security.

In order to allow the development of satellite and airborne AIS surveillance, AIS1 and AIS2 should be available nationwide, not just in the coastal areas. Maritel should be fairly compensated for this.

If Maritel is the frequency coordinator for AIS, then it will naturally expect to gain revenue from this. This amounts to a "tax" on AIS users. If we are to have voluntary AIS carriage on small boats, AIS should be subsidized, not taxed.

There is justifiably much reluctance to allow any other forms of messaging on AIS1 and AIS2. Maritel can capitalize on this by providing AIS compatible messaging and other data services on it's adjacent spectrum. Nothing in the IEC 62287 draft specification prevents manufacturers from providing additional capabilities

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beyond AIS on other appropriate spectrum. We intend to provide a 3rd channel in our Class B transponders for "other" data services.

I must respectfully disagree with Maritel's AIS interference testing conclusions in Appendix A of DA 03-3585. We performed informal tests using a JRC Class A AIS and several SEA157 VHF DSC radios and they worked fine together. Beyond a 25 KHz guard channel, we found that AIS is virtually undetectable. With AIS and VHF radio antennas spaced 8 feet on a boat, the AIS would not break squelch on the VHF radio. During simplex radio conversations on channel 86B (using radios modified for this frequency of operation), there was an audible "click" heard during voice conversations whenever the onboard AIS transmitted a pulse. Still it did not interfere with voice communications because the duty cycle of the AIS transmitter is so extremely low. This is a worst case test for AIS/marine VHF interference and it worked surprisingly well.

AIS transponders from other ships were undetectable on the SEA157 even when it was tuned to 87B and 88B. This may be because the AIS pulse is shorter than the squelch attack time on the SEA157. Other radios may behave differently.

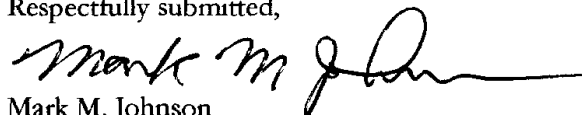
If a manufacturer combined AIS and data communications capability into a single unit, it would be even easier to prevent AIS/DATA interference.

It is apparent from the Maritel testing results that the biggest interference problem is unique to Maritel. Maritel is the only company that will transmit on the VPC shore station channels. Therefore Maritel's towers will be the worst possible locations for AIS receiver monitoring.

In conclusion we maintain that:

1. AIS is vitally important to safe navigation and homeland security. It serves thousands of vessels and uses only a small amount of spectrum.
2. Channels 27B, 87B, 28B and 88B should be "taken" from Maritel. Maritel has not used these channels effectively over the past 4 ½ years and there is a compelling need of them for AIS.
3. Maritel should be fairly compensated for this taking.
4. This is a very opportune time to "take" these channels because they are currently unused.
5. Very little, if any "frequency coordination" of AIS is needed. Boat US does a great job of MMSI registration at no charge. If anything else is needed, AIS manufacturers will most likely do it voluntarily at no cost to the end user or the government.
6. Maritel's proposed "AIS frequency coordinator" role amounts to taxation of AIS users and will hinder the proliferation of voluntary carriage AIS.
7. Although the interference tests referred to in Appendix A of DA 03-3585 were valid tests, I strongly disagree with the conclusions. AIS and VPC (or data services) can coexist easily if AIS channels also have guard channels.
8. Maritel can still compete very effectively in the AIS market. There is much need for other marine data services in conjunction with AIS. Since Maritel is the licensee of the adjacent VPC channels, it is uniquely suited to provide these services. AIS may save Maritel, if it is not "taxed".

Respectfully submitted,



Mark M. Johnson

President, Shine Micro, Inc./Sealinks